METHODS OF ESTABLISHING CAPITAL COSTS

Abstract:
Capital cost represents an important element in the orientation of investments on the market. The most important component when comparing the investment alternatives is risk, respectively the uncertainty level with which the investor will achieve the expected profitability in a certain period of time. Capital cost represents a direct link between the investments’ profitability and the profitability claimed by the capital bearers. Capital cost represents an acceptance or rejection indicator of an investment project, respectively of the investment decision. The cost of equity capital is equivalent to the level of profitability expected by the businesses’ financers, shareholders or creditors. The potential gain of the equity holder must be big enough to encourage them to buy stocks and also to keep them, a situation which is characterized by an estimated rate of return which covers the risks of the financial investment.

Key words: capital cost, opportunity cost, actual annual cost, ownership equity, loaned capital

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1. Methods of establishing capital cost

Capital cost represents the minimum rate of return needed in order to satisfy the profitability demands of the shareholders (cost of equity capital) and of the company’s creditors (cost of loaned capital) to attract financing sources for a certain investment. In economical terms, it is called opportunity cost.

Opportunity cost represents the cost of lost options, respectively that rate of return of the invested capital which is attractive for an investor, determining him/her to opt for a certain investment from a long series of other alternative investments which have similar risk conditions. An investor who chooses a certain investment looses other opportunities offered by other investment alternatives. A well-informed investor will choose that option from which he hopes to obtain maximum profitability in similar risk conditions.

The discount rate has 3 components: real rate without risk, annual estimated inflation rate, and risk premium.

The main component of the discount rate is the risk premium, this being also the hardest to
evaluate. The risk premium is defined as an additional rate of profitability added to the no-risk rate, in order to compensate the investor for taking the risk.

The cost of equity capital represents that rate of return that a company must make in order to maintain the business’ value. If the rate of return is smaller than the cost of opportunity, then the business’ value drops, and if the rate of return is superior to the opportunity cost then the business’ value will grow.

The size of the ownership equity cost depends on the following factors:
- Capital gain,
- Expected dividends,
- Rate of return without risk,
- Risks taken by the investor,
- Current cost of the share on the market.

The loaned capital represents the debts made by a company, during a certain time frame, at a certain cost (interest rate) established by contract, with preferential payment rights towards the cost of equity capital. Usually a company uses bank loans and bond loans to attract capital loaned in financing the activity.

Usually, the investment risk assumed by the creditors is lower than the risk assumed by the shareholders and normally the cost of the loaned capital is lower than the ownership equity’s cost. This doubly so as the interest is a fiscally deductible expense and thus the loans’ cost generates tax savings regarding the cost of equity capital.

The actual annual cost of capital (AAC) is established according to the formula:

\[ AAC = \left(1 + \frac{R_{\text{nom}}}{n}\right)^n - 1 \]

Where: \( AAC \) = the actual cost of capital
\( R_{\text{nom}} \) = nominal annual interest rate
\( n \) = number of payment periods during a year.

There are numerous methods for establishing the cost of equity capital:\footnote{Anghel I., Oancea Negescu M., Anica Popa A., Popescu A.M., - Evaluarea întreprinderii, editura Economică, București, 2010, pp. 185–187.}: build-up method, CAPM method, the modified CAPM method, the Gordon method, arbitrage method (APM).

The Build-up Method is used to establish the capital cost for unrated companies, according to the formula:

\[ E(R_i) = R_f + R_{P_m} + R_{P_{sz}} + R_{Ps} \]

Where: \( E(R_i) \) = expected return rate of the invested capital
\( R_f \) = risk-free rate
\( R_{P_m} \) = market risk premium which reflects the return rate expected on the market on which the ownership equity’s tool is being transacted; it is calculated as the difference between the medium expected rate of return of a diversified portfolio of quoted shares \((M_r)\) and risk-free rate \((R_f)\), meaning

\[ R_{P_m} = M_r - R_f \]

\( R_{P_{sz}} \) = size risk premium
\( R_{Ps} \) = company specific risk premium.

In the US, the risk-free rate takes into account the yield to maturity of the state bonds on a 10-year term, because this period is coherent with the great majority of investment projects where the cash-flows are established for a 10 year period. The level of the risk-free rate of return should be 4 – 6%.

Size risk premium \( (R_{P_{sz}})\) expresses the existence of an additional unsystematic risk for small quoted companies and implicitly the attainment by them of a rate of return higher than the medium profitability of the stock market.

The company specific risk premium \( (R_{Ps})\) comprises additional percents (between 1 and 5%) associated with certain possible risks: management risk, financial risk, operating risk, market risk.

The CAPM model is used especially to establish the capital cost in the companies quoted on the market. This is the formula:

\[ E(R_i) = R_f + \beta \times R_{P_m} \]

The coefficient \( \beta \) expresses the investment’s systematic risk calculated by comparing the volatility of a share to the volatility of all prices on the capital market. If the flow of all shares increases with 25%, same as the flow of the quoted share, and subsequently the flow of all shares drops with 25%, same as the flow of the quoted share, one can say that the share’s volatility is in accordance with the market, and \( \beta \) will have in this case the value 1. If the flow of all shares increases with 10%, the flow of the share increases with 14%, and subsequently the flow of all shares drops with 10% and the flow of the quoted share is reduced by 14%, the \( \beta \) coefficient will be 1,4, meaning 14% divided by 10%. If the flow of all shares increases with 18%, of the quoted share with 9%, and afterwards the flow of all shares is reduced by 18% and of the quoted share with 9%,
the $\beta$ coefficient will be 0.5, meaning the rate between 9% and 18%.

In conclusion, the higher the value of the $\beta$ coefficient, the higher the possibility of having a high volatility of a share.

The modified CAPM model is used to determine the capital cost of unquoted companies and consists in adding to the CAPM model of size risk premium ($RP_{sz}$) and of the company specific risk premium ($RP_s$), according to the formula:

$$E(R_i) = R_f + \beta \times RP_m + RP_{sz} + RP_s$$

The arbitrage theory (APT) is used mainly by big companies listed on the stock market. This model uses multiple $\beta$ coefficients, which express the sensitivity of profitability of shares towards the variation of certain macroeconomic factors (inflation, share’s fluctuation, decrease in certain sectors of activity, decrease of the investors’ trust in some business). The formula is the following:

$$E(R_i) = R_f + P_1 \times \beta_1 + P_2 \times \beta_2 + \ldots + P_n \times \beta_n$$

where: $P_1, P_2, \ldots P_n = risk\ premium\ associated\ with\ the\ influential\ economic\ factors$

$\beta_1, \beta_2, \ldots \beta_n = the\ sensitivity\ of\ the\ share\ towards\ every\ risk\ factor,\ compared\ with\ the\ medium\ sensitivity\ of\ the\ market\ regarding\ that\ factor.$

The Gordon model implies establishing the cost of equity capital according to the price (flow) of a share and the annual dividend attributed to one share. There are more ways to establish the cost of equity capital, taking into account if the dividends are modified (grow) or not.

If the dividends are constant for an unlimited period of time, the formula is:

$$CEK = \frac{D_0}{R_s}$$

where: $CEK = cost\ of\ equity\ capital$

$D_0 = current\ dividend\ per\ share$

$R_s = share’s\ market\ rate\ after\ the\ dividend’s\ payment.$

If the dividends have a constant growth rate (g), then the formula will be:

$$CEK = \frac{D_1}{R_s} + g$$

Where: $D_1 = expected\ dividend\ per\ share\ after\ one\ year\ of\ possession\ of\ the\ share$ and it is established using the formula: $D_1 = D_0 (1 + g)$

$g = annual\ constant\ growth\ rate\ in\ perpetuity\ expected\ for\ the\ dividends.$

The loaned capital consists of the loans taken by the company to finance the production cycle (investments, operation). These loans have a certain interest, and the financial expenses are many times deductible (the degree of indebtedness should not have a higher value than 3). These being deductible expenses, the company saves on taxes, compared to crediting from own funds which does not have deductible expenses (dividends tax is not deductible). Thus, the cost of equity capital is higher than that of the loaned capital.

A company can take loans through the issues of shares, bonds, bank loans.

The share is a security that shows the part that its possessor (shareholder) owns from a company’s capital. Shares can be ordinary (it gives the possessors the right to dividends calculated at the net profit) and preferential shares which are characterized by compensating their owners with a fix dividend, before paying the dividends for ordinary shares, but after paying the interest afferent to the bonds issued by the company. The cost of the shares’ equity capital is established according to the following formula:

$$CEK = \frac{D}{P_n}$$

Where: $D = annual\ dividend$

$P_n = market\ price\ minus\ the\ subscription\ expenses.$

A bond is a long-term payment promise, with a maturity of over one year, issued by a public or private entity. A bond is document issued by a company that needs financing, on the basis of which it obtains a loan. Bonds are financial assets with fixed interest. When paying back the loan, the company must also pay an interest, established at the time of issuing the bond.

According to the type of income, the bonds are divided into two categories:

a) with interest, issued at the nominal value, that can be given back at the due date, to which an interest is added, which represents the investor’s income, payable periodically or at the due date;

b) with zero coupon (with discount), issued at a lower price than the nominal value and which is given back at the due date, the difference being the investor’s income.

The bonds’ main characteristics are loans’ payment data and the reimbursement of the loan bonds data, but also the coupon.

The coupon represents the payment of the interest one by the bonds’ owners during the lifespan of that bond.
For perpetual bonds, with annual perpetual interest, the cost of loaned capital \( (C_{LK}) \) is given by the formula:

\[
C_{LK} = \frac{D}{V_{P_0}}
\]

This formula does not take into account the incidence of income tax. If we also take into account the aforementioned tax, then the formula will be:

\[
C_{LKAT} = C_{LK} \times (1 - 0,16)
\]

where: \( D \) = annual coupon
\( V_{M_0} \) = the bond’s market value
\( C_{LKAT} \) = the cost of loaned capital after taxes.

For bonds with a buy-back term and with an annual or biannual interest payment, and also for bonds with discount and zero interest (coupon), the cost of loaned capital is given by the internal profitability rate (IPR).

The internal profitability rate is that discount rate at which the present value of the stream of interest and of the buy-back price at maturity is equal with the current market value of the bonds (without the annual interest).

In case of bonds with a buy-back term and with a biannual interest payment, one can establish the gross price of a share \( (P_{GS}) \) by using the formula:

\[
P_{GS} = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \ldots + \frac{C_n}{(1+r)^n} + \frac{M}{(1+r)^n}
\]

where: \( C_1, C_2, \ldots, C_n = \) payments corresponding to coupons
\( r = \) periodical payment of the interest (IPR) is established by correcting the annual interest through updates
\( M = \) value of the main at maturity
\( n = \) number of biannual coupons (number of years x 2).

The cost of loaned capital \( (C_{LK}) \) is established according to the formula:

\[
C_{LK} = R_1(1 - R_{PT})
\]

\( R_1 \) = nominal interest rate, is determined according to the formula:

\[
R_1 = \frac{\text{Financial expenses - Financial income}}{\text{Debts}}
\]

\( R_{PT} \) = profit tax rate.

The weighted average cost of capital \( (WACC) \) represents the discount rate established as a weighted average of the cost of all financing sources, calculated according to the market value of these resources. WACC is calculated by taking into account 4 elements:

- \( c_{EK} \), cost of equity capital (yield expected by the shareholders for the invested capitals);
- \( c_{LK} \), cost of loaned capital;
- \( G_{OE} \), the share of ownership equity in the total of the investment;
- \( G_{LK} \), the share of loaned capital in the total of the investment.

\[
WACC = c_{EK} \times G_{OE} + c_{LK} \times G_{LK}
\]

\( EK = \) equity capital
\( OE = \) ownership equity
\( LK = \) loaned capital (total of short and long-term debts)

The weight of the capital used for financing the investment.

This formula can be used in case of economic growth and when the financing cost of the resources is maintained for many years. If these costs undergo some changes, then discount rates must be calculated for different periods (when there will be no changes in the level of financing cost).

### Conclusions

The cost of equity capital must be compared with the company’s forecasted rate of return to approve or maintain an investment (activity). There are many investment alternatives on the market, but the “rule” is that a higher profitability implies a higher risk applies. Thus, the government bonds have a minimal risk because they are guaranteed by the state, their profitability being of 5-6%. Bank deposits have a low risk, being guaranteed up until a certain amount by the central bank, their profitability being around 6-7% in the national currency. Bonds at a strong multinational company also have a low risk, as the corporation enjoys high credibility, profitability can reach up to 10%. If one refers to bonds at a company quoted on the market, then the risk is medium, which also includes the possibility that the company will not make sufficient profits to remunerate its investors. In this case profitability can be higher than 12%. In case of an unquoted company, the risk is between medium and high, there is little guarantee that the amounts invested will be retrieved, but the expected profitability is around 20%. This enumeration of investment criteria cannot be considered safe by any investor,
because there can be many surprises. Theoretically, things are like this, but practice has shown the contrary many times.

**BIBLIOGRAPHY**


